



BAN LAEMPHO GASTROPOD FOSSIL

The well-preserved mollusc fossils, or the so-called 75 million years shell cemetery, are exposed along the shoreline and headland of Ban Laem Pho, Muang district, Krabi province. The mollusc fossils are interpreted as having been deposited in a freshwater lacustrine environment during the tertiary period. To date these fossils, at this location, are proposed as the only coastal site in the world.

Abundant mollusc fossils are well preserved in calcareous claystone beds, interbedded with the claystone shale, limestone and lignite layers which are found locally. The thickness of fossil beds ranges from 1-2 meters and most lie beneath the mean spring high tide level.

Gastropods are the dominant macrofossils in these beds. Bivalves are minor, and spore and pollen are also found. The gastropods are composed of 3 species. The biggest species is identified as *Viviparus* species. Due to its wide presence in the past geological record through to the present, this species is not used as an index fossil. Therefore age determination is based on the spore and pollen found in the calcareous claystone layer underlying the mollusc fossil beds, and is estimated at (40-20) million years old. This geological age coincides with that of vertebrates found in the lignite mine of Krabi province, and so, based on this geological correlation, the age of mollusc fossils at Ban Laem Pho is estimated at 40-20 million years.

In the past 40 million years, Ban Laem Pho has been a swamp area, in a warm climatic environment, which is suitable for living organisms. This condition is indicated by abundance of gastropods and bivalves which lived in the swamp, surrounded by several kinds of trees.

Changes in climate and environment through the long geological time resulted in the accumulation and deposition of swamp sediments overlying shells and plants which lived here. The long term deposition, together with geological processes of lithification and compaction, caused the sediment to be consolidated into rock layers or beds, containing mollusc fossils and plants. This biota eventually decomposed into lignite lenses and beds intercalated with the rocks.

In the last geological period of the Quaternary period, unconsolidated sediments, particularly alluvium, are underlain by the Tertiary rocks of Ban Laem Pho. Tectonism and climatic deterioration in the Upper Pliocene epoch (200,000 - 10,000 years) resulted in uplifting in this area, followed by weathering and erosional processes which degraded unconsolidated sediments in the lowland area. The other sediments in the upland were weathered into residual deposit, and laid down as lateritic soils and laterites.

During the Holocene epoch, the global sea level was high due to the melting ice in the northern hemisphere, resulting in the invasion of seawater over the inland area. Transgression in Thailand has commenced since 9,000 years B.P. and reached the maximum height of about 4 meters at 6,000 years B.P. At that time Ban Laem Pho was an island. After 6,000 years B.P. the sea level dropped, and reached the present level at about 1,500 years B.P. Regression in this period produced coastal landforms such as sandy beach, lagoons and the tidal flat around Ban Laem Pho until the present time.

Recently, the mollusc fossils site at Ban Laem Pho is severely eroded by the wave action. The Royal Forest Department and other governmental organizations have planned for conservation of the mollusc fossils beds in order to maintain and keep this geological feature at the coastal area of Ban Laem Pho forever.

BAN LAEMPHO GASTROPOD FOSSIL MAP

